# CHAPTER 5
# Conclusions and Recommendations

Based on the information contained in this report and the selected supporting references, staff concludes the following:

1) The principle functions of the Water Table Aquifer include: provision of base flows to surface water features; water supply; and structure support to overburden. There is insufficient information available pertaining to the relationship between groundwater base flows and the protection of surface water bodies particularly with regard to defining significant harm to these water bodies. It is concluded that the definition of significant harm to major rivers, streams, lakes, slough and wetland systems should be based on ongoing research currently being conducted in the Lower West Coast Planning Area. Defining a minimum level for the Water Table aquifer to protect surface water bodies using existing information would not be supported by sufficient data at this time.

2) The principle functions of the Lower Tamiami, Sandstone and Mid-Hawthorn aquifers are: water supply and structural support to the overburden. The ability of these aquifers to function as sustainable water supply sources would be significantly harmed if the potentiometric head of these semi-confined aquifers is lowered below the top of the aquifer. Such a reduction in head could result in a significant reduction of aquifer supply function. Harmful impacts identified with exceeding the minimum aquifer levels include: air entrapment in the aquifer, geochemical changes affecting water quality, potential reduction in porosity of the aquifer materials as a result of changes in dissolved ion stability, and potential reductions of inter-aquifer migration of recharge related to compaction of clayey confining beds. These harmful impacts would occur rapidly as the water levels dropped below the proposed MAL. Therefore the duration of such a water level exceedance should be minimal.

3) The potential for subsidence and impacts to the function of structural support to the overburden is considered to be low but real none the less. While there is limited data available for evaluating the magnitude of potential subsidence in the LWC aquifers, there is consensus among the scientists reviewing the available data, that there is a real potential for subsidence. Further, additional research is warranted to better quantify the degree of groundwater level drawdown that would be critical to the LWC aquifers. Based on existing information and methodologies evaluated, the guideline proposed of limiting drawdown to no more than 75% of the distance between the pre development potentiometric head and the top of the aquifer appears to represent a first order estimate of the maximum developable limit of drawdown. Reduction of groundwater levels below this guideline may be harmful with regard to compaction and subsidence.

4) The consumptive use permitting program has been effective in limiting the degree of groundwater drawdown to prevent harm to the water resources since its inception in the mid 1970's. However, groundwater levels have continued to decline and drop below pre-development levels in the Lower Tamiami, Sandstone, Mid-Hawthorn, and Floridan aquifer system. While these lower levels haven't resulted in harm to the aquifers, there are some

areas within the LWC where the maximum permitable limit of an aquifer has been or is close to being reached under the 1 in 10 drought LOC. No new uses are permitted when these conditions occur. As a result, the conditions which could produce a minimum aquifer level exceedance are: if a water user violates his water use permit; local governments allow exempt domestic wells to proliferate in these areas; and a drought more severe than 1 in 10 condition occurs.

5) Based on existing groundwater level data and the 20 year demand projections contained in the LWCWSP (SFWMD, 2000), it is concluded that the proposed minimum aquifer level criteria is not being exceeded, nor is it anticipated that the criteria would be exceeded in the next 20 years provided the proposed prevention plan (Chapter 4) is implemented.

6) The water supply function of the Floridan Aquifer System is not expected to be harmed by consumptive use over the next 20 years. The use of the Floridan Aquifer System is anticipated to be low due to the salinity/treatment costs associated with the supply.

Based on information compiled in this report and consistent with the conclusion above staff makes the following recommendation.

1) The District should adopt rules, pursuant to the authority provided in Chapter 373.042 F.S., that establish minimum aquifer levels for the Lower Tamiami, Sandstone and Mid-Hawthorn aquifer based on the significant harm definition contained herein. This rule shall define the minimum aquifer level as the structural top of the source aquifer as described in Chapter 4.

2) The District should continue the ongoing research into the effects of hydrologic variations on the functions of isolated wetlands as recommended in the governing board approved LWCWSP.

3) The District should continue its joint venture with the USACE in conducting the South West Florida Feasibility Study as recommended in the Governing Board approved LWCWSP and the LECWSP. A component of this study should include collection of data to quantify the relationship between groundwater and surface water flows and environmental function of the Orange, Estero, and Imperial rivers and the Six Mile Cypress Slough and Fakahatchee Canal.

4) The District should adopt CUP rules that establish maximum developable levels for the Lower Tamiami, Sandstone and Mid-Hawthorn aquifers. These rules would identify the lowest safe level of groundwater that could quality for a water use permit. Such levels shall be established above the proposed minimum levels recommended in this paper.

5) The District should implement all provisions of the minimum aquifer level prevention plan described in Chapter 4.

6) The District should fund the construction of specialized monitor wells to measure subsidence. These wells should be located in areas where the greatest groundwater drawdown occurs. The addition to construction of the test wells, the district should complete compaction tests on cores of the aquifer and confining materials as recommended by the peer review of the District subsidence paper.